REMARKS

Claims 1-16, and 29 are pending in this application. Claims 1-16 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2002/0006689 A1 for Miyasaka ("Miyasaka") in view of U.S. Pat. No. 5,773,088 to Bhat ("Bhat"). New claim 30 is added. No new matter is added. Claims 1-16, 29 and 30 remain in the case. Applicant requests reconsideration and allowance of the claims in light of the above amendments and following remarks.

Rejections - Under 35 U.S.C. § 103

Claims 1-16 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable Miyasaka in view of Bhat. The rejections are respectfully traversed.

Claim 1 is amended to recite,

A method of forming multi-layers for manufacturing a thin film transistor (TFT) using multiple process chambers, comprising:

forming a first layer of silicon dioxide for the thin film transistor on a glass substrate using a first physical vapor deposition in a first process chamber;

transferring the substrate including the first layer to a second process chamber without breaking vacuum;

sequentially forming a second layer of amorphous silicon for the thin film transistor in the second process chamber using a second physical vapor deposition on the first layer without breaking vacuum; and

forming additional layers on top of the second layer to form the thin film transistor.

The Examiner in the February 28, 2003 Office Action notes that Miyasaka only suggests using a plasma-enhanced chemical vapor deposition (PECVD) layer when forming two films without breaking vacuum. (Miyasaka, paragraph 241). Thus, Miyasaka teaches away from the present invention by using a chemical PECVD process when a vacuum is maintained between the two layers. Miyasaka never suggests applying a first non-chemical physical vapor deposition and then applying a second non-chemical physical vapor deposition while maintaining a vacuum.

The Examiner cited Bhat for disclosing sputtering chambers linked to perform sequential sputtering processes without breaking vacuum. Applicant provided arguments in the response to the February 28, 2003 office action that the dual chambers shown in Bhat are unrelated to forming transistors and therefore it would not be obvious to combine Bhat with

Miyasaka. The Examiner in the November 19, 2003 office action noted that Applicants argument regarding Bhat was not persuasive because the limitation of forming a thin film transistor using two chambers without breaking vacuum was only specified in the preamble of the claims. The claims have been amended to specify in the claims that the first and second layers are used for forming a thin film transistor.

The combination of Miyasaka and Bhat do not suggest using a glass substrate for forming a first layer of silicon dioxide for the thin film transistor using a first non-chemical physical vapor deposition in a first process chamber and then transferring the substrate including the first layer to a second process chamber without breaking vacuum and sequentially forming a second layer of amorphous silicon for the thin film transistor in the second process chamber using a second non-chemical physical vapor deposition on the first layer without breaking vacuum.

Miyasaka teaches away from the invention by using a conventional chemical deposition process and a single chamber. The system as described in Miyasaka would generate a silicon layer with an unacceptably high water content degrading the performance of the TFTs. The system in Miyasaka would require an extra annealing process that complicates the fabrication of the TFT by becoming a source for contamination.

The dual chambers shown in Baht have nothing to do with forming thin film transistors and therefore would not be obvious to combine with Miyasaka. But regardless, even if Baht and Miyasaka where combined, together they still do not suggest forming two non-chemical physical vapor deposition layers on a glass substrate while maintaining a vacuum.

The combination of Baht and Miyasaka also does not suggest the particular combination of sputtering compositions as specified in the dependant claims. For example, the combination of Baht and Miyasaka also does suggest a first layer formed using a gas mixture of Ar+O2 and a SiO2 target P-doped with a resistivity of 1-50 Ohms-centimeters as specified in claim 2. The particular combinations of materials specified in the dependant claims have been found to optimize the reduction of H_2 in the silicon layers, thus, eliminating the annealing that typically has to be performed after forming the first base-code layer.

New claim 30 also specifies using a mixture of He/Ar gas to form the second layer while introducing a hydrogen flow. This is also not suggested in Baht or Miyasaka.

CONCLUSION

For the foregoing reasons, reconsideration and allowance of claims 1-16, 29 and 30 of the application as amended is solicited. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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